Remarks/Arguments

The Examiner rejected claims 6-20 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 6 and 7 has been amended to more recite that they are now dependent on claim 1.

The Examiner rejected claims 1 and 3, and 8 under 35 U.S.C. 102(b) as being anticipated by U.S. 4,874,985 to Hase et al. ("Hase"). Claim 1 has been amended to incorporate the recitation of claims 4 and 5. Claim 5 has been determined to be allowable by the Examiner. Thus, Applicants submit that all pending claims are now allowable.

Applicants present claim 1 is directed to a phosphor of formula ZnS:RE where RE is selected from terbium and europium and the atomic ratio for terbium or europium to zinc is about 0.005 to 0.02.

In contrast, the Hase patent is directed to sulfide phosphors of formula:

$$(Zn_{1-x}Cd_x)S: eM^{I'}, fM^{III'}, gX'$$

Where $M^{I'}$ is at least one of copper and gold, where $M^{III'}$ is at least one of gallium and indium, and where X' is at least one of chlorine, bromine, iodine, fluorine and aluminum. x is equal or greater to zero but less than or equal to 0.4, e is equal or greater than 10^{-8} but less than or equal to 10^{-2}, f is equal or greater than $5x10^{-8}$ but less than or equal to $5x10^{-3}$, and g is equal or greater than $5x10^{-8}$ but less than or equal to $5x10^{-3}$.

It is true that when x=0 in Hase, the phosphor is ZnS. However, it still has a formula where it contain three co-activators (since none of e, f or g can be =0). The examples for Hase show phosphors such as ZnS:Cu,In,Al (Example 2) or ZnS:Au,In,Al (Example 4). The Examiner states that at least one activator can be replaced with europium. Nevertheless, even assuming that one of $M^{I'}$, $M^{III'}$, or X' could be replaced by Eu, such a phosphor would still have three activators (Eu and two of the group $M^{I'}$, $M^{III'}$, and X'). In contrast, the presently claimed phosphor has only a single activator (i.e. Eu or Tb). Thus, Hase does not anticipate the present claims. Summarily, the Examiner's comments regarding the grain size are irrelevant since the claimed phosphor formulation is different than that disclosed in Hase.

Finally, and as even more proof that Hase does not anticipate the present claims, Applicants note that the examiner has indicated allowance of claims relating to a thick dielectric EL display, but has rejected claims to an EL phosphor material on the basis of Hase. Hase teaches a zinc sulfide based phosphor than may contain fluorine for use as a CRT (Cathode Ray Tube) phosphor.

Applicants would like to point out that a CRT phosphor is in the form of a powder that is formed into a slurry and applied to the inside of the viewing face of a CRT. These phosphors are excited by a high voltage electron beam accelerated through a vacuum before the beam impinges on the phosphor film where the electrons stimulate activator atoms to generate light. By contrast, the EL phosphors taught in the present invention are thin film vacuum deposited phosphor layers that are excited by the injection of electrons at the interface between the phosphor and adjacent dielectric layers and accelerated within the phosphor layer to generate light by stimulation of the activator atoms.

This requirement of electron acceleration within the phosphor layer imposes conditions on the properties of the phosphor layer that are not required or present for CRT phosphor materials. Further, CRT phosphors can be prepared at high temperature as powders and then applied in a paste or slurry composition to the CRT tube, and there is no requirement to crystallize the material following deposition of the thin film at a temperature compatible with the temperature that can be withstood by the rest of the display structure during the crystallization process. A central point of the present invention is to facilitate crystallization at a lower temperature. Thus, even if Hase disclosed the same formulation as the present application, it would not disclose an EL phosphor for a thick film electroluminescent display as recited by present claim 1.

In light of the above, Applicants request withdrawal of this rejection.

The Examiner indicated that claims 21-31 and 42-44 were allowed.

CONCLUSION

In view of the foregoing comments, Applicants submit that claims 1, 3, and 6-44 are in condition for allowance. Applicants respectfully request early notification of such allowance. Should any issues remain unresolved, the Examiner is encouraged to contact the undersigned to attempt to resolve any such issues.

If any fee is due in conjunction with the filing of this response, Applicants authorize deduction of that fee from Deposit Account 06-0308.

Respectfully submitted,

FAY SHARPE LLP

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Date

Joseph E. Waters, Reg. No. 50,427
1100 Superior Avenue, Seventh Floor
Cleveland, Ohio 44114-2579
(216) 861-5582

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